

**US Army Corps
of Engineers®**

St. Louis District

Pools 25 and 26 Islands

Mississippi River Navigation Pools 25 and 25

St. Charles, Lincoln, and Pike Counties, Missouri

Habitat Rehabilitation and Enhancement Project, Upper Mississippi River System-Environmental Management Program

Environmental Assessment with Draft Finding of No Significant Impact and Section 404(b)(1) Evaluation Report



December 2007

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Environmental Assessment with Draft Finding of No Significant Impact

Pools 25 and 26 Islands Mississippi River Navigation Pools 25 and 26 St. Charles, Lincoln, and Pike Counties, Missouri

Habitat Rehabilitation and Enhancement Project Upper Mississippi River System-Environmental Management Program

I. Introduction

This Environmental Assessment (EA) has been prepared by the St. Louis District in accordance with the National Environmental Policy Act. This document describes potential environmental, economic, and social impacts associated with the proposed recommended plan and other alternatives considered for the Pools 25 & 26 Islands Habitat Rehabilitation and Enhancement Project. This EA also includes a Biological Assessment prepared in accordance with the Endangered Species Act.

A. Project Location Five islands comprise this project area (Howard, an unnamed island next to Howard, Westport, Dardenne, and Bolter), and they are located in Mississippi River Pools 25 and 26 between river miles 224 and 261. The islands are owned by the Corps of Engineers and managed for fish and wildlife purposes by the Missouri Department of Conservation through a cooperative agreement. Howard Island and the unnamed island next to it are in Pool 25 in Pike County, Missouri, and they are about four miles east of Annada. Westport Island, also in Pool 25, is in Lincoln County, Missouri, and it is about five miles east of Elsberry. Dardenne and Bolter Islands are located to the south in Pool 26 in St. Charles County, Missouri, and these two islands are about five miles north of St. Peters (FIGURE EA-1 and FIGURE EA-2).

B. Project Authority This project has been conducted under the authority of the Habitat Rehabilitation and Enhancement Project (HREP) component of the Upper Mississippi River System-Environmental Management Program. Initial authorization and appropriations for the Environmental Management Program were provided on August 15, 1985 by the Supplemental Appropriations Bill (PL 99-88). A more comprehensive authorization was provided by Section 1103 of the Water Resources Development Act (WRDA) of 1986 (PL 99-662). Subsequent WRDA language of 1992, 1996, and 1999 further modified the authorization.

C. Need for Proposed Action, Project Purpose and Objectives Habitats of the Upper Mississippi River System have declined over the last two centuries. Floodplain forests have been substantially reduced in spatial extent and suffered losses in tree species diversity. Aquatic and riverine habitats have also declined due to river and floodplain development, and alteration of natural hydrological regimes, flow patterns, and disturbance dynamics. The purpose of the proposed work is to improve conditions of aquatic and terrestrial habitats on islands in Pools 25 and 26 of the Upper Mississippi River. Planning objectives include 1) increasing the spatial extent of the oak-hickory community in floodplain forests, 2) restoring and maintaining connections between the river and adjacent backwater habitats, 3) creating and maintaining deepwater habitat in backwater areas, and 4) maintaining islands.

PROJECT LOCATIONS

Lock and Dam 24

Hamburg

Hardin

Batchtown

Lock and Dam 25

Grafton

St. Charles

St. Louis

Lock and Dam 27

Alton

Lock and Dam 2

Arnold

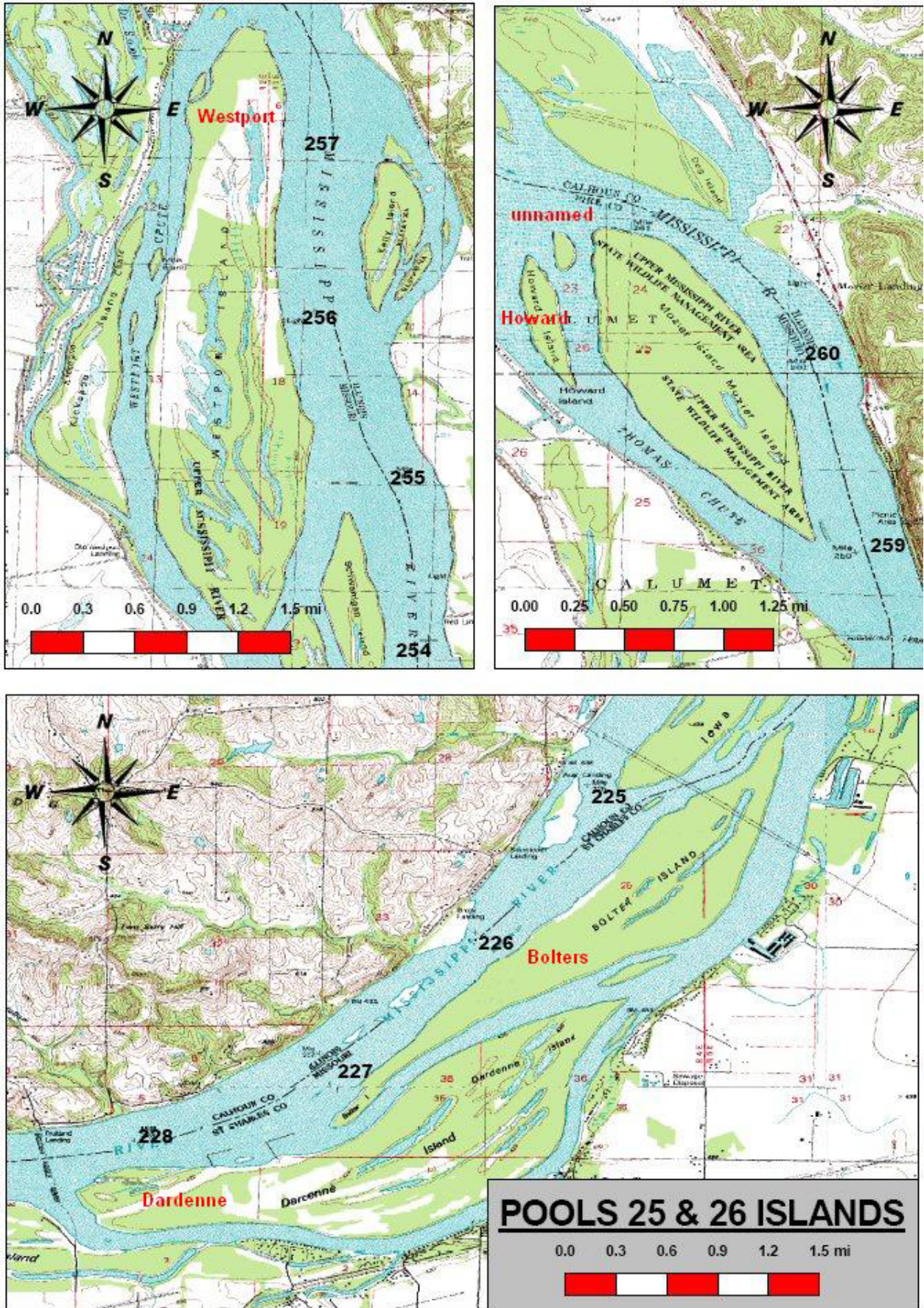
Waterloo

Jerseyville

Carrollton

10 5 0 10 Mile

FIGURE EA- 2. Project Area's Islands



II. Project Measures, Alternatives, and Recommended Plan

A team of biologists from the U.S. Fish and Wildlife Service, Missouri Department of Conservation, and St. Louis District developed a total of eight features or measures to address the habitat objectives (TABLE EA-1). Nine separate alternatives were evaluated in detail, and they consist of unique combinations of these eight measures (TABLE EA-2). A no-action alternative was included in the evaluation, under which no improvements would be made to terrestrial and aquatic habitats of the targeted islands.

TABLE EA- 1. Description of proposed measures.

Measure	Island	Objective Addressed	Description of Measure
A	Westport	1	<ul style="list-style-type: none"> plant oak-hickory tree seedlings in abandoned cropland at elevations where they naturally regenerate (440 feet NGVD)
B	Dardenne	1	<ul style="list-style-type: none"> plant oak-hickory tree seedlings in abandoned cropland at elevations where they naturally regenerate (428 feet NGVD)
C	Bolter	2, 3	<ul style="list-style-type: none"> excavate/dredge an island channel to restore connection to river; excavate/dredge a deep hole in slough; build rock structure in slough that will use river's energy during floods to maintain deep hole
D	Dardenne	3	<ul style="list-style-type: none"> excavate/dredge a deep hole in side channel; build rock structure in side channel that will use the river's energy during floods to maintain deep hole
E	Westport	3	<ul style="list-style-type: none"> excavate/dredge a deep hole in slough; build rock structure in isolated slough that will use the river's energy during floods to maintain deep hole (structure #3)
F	Westport	3	<ul style="list-style-type: none"> excavate a deep hole in abandoned cropland; build rock structure in abandoned cropland that will use the river's energy during floods to maintain deep hole (structure #6)
G	Westport	2	<ul style="list-style-type: none"> excavate/dredge an island channel to restore connection to river; install water control structure in island channel to temporarily hold water in island's interior sloughs
H	Howard & unnamed	4	<ul style="list-style-type: none"> place bank revetment on upstream ends of islands to minimize erosion

TABLE EA- 2. Measures included in Recommended Plan (shaded) and other Evaluated Alternatives.

Measure	Island	Alternatives								
		No Action	1	2	3	4	5	6	7	8
A	Westport			✓	✓	✓	✓	✓	✓	✓
B	Dardenne				✓	✓	✓	✓	✓	✓
C	Bolter					✓	✓	✓	✓	✓
D	Dardenne								✓	✓
E	Westport							✓	✓	✓
F	Westport						✓	✓	✓	✓
G	Westport		✓	✓	✓	✓	✓	✓	✓	✓
H	Howard & unnamed									✓

A. Summary of Recommended Plan (Alternative 4) The recommended plan, shown in TABLE EA- 2 as Alternative 4, is summarized below and consists of making several habitat improvements at three islands. A more detailed description follows.

Westport Island (Pool 25) - Reforesting 59 acres of abandoned crop fields; removing sediments from an existing channel to improve the connection between the river and an interior slough complex; installing a water control structure in the channel;

Dardenne Island (Pool 26) - Reforesting 52 acres of abandoned crop fields;

Bolter Island (Pool 26) - Removing sediments from an existing channel to improve the connection between the river and an interior slough; creating a 0.5-acre area of deep water; constructing a rock dike structure adjacent to the deep hole.

B. Detailed Description of Recommended Plan (Alternative 4) The recommended plan is featured on drawings appended to this document. (For the digital version of this document available at <http://www.mvs.usace.army.mil/pm/pm-reports.html>, the maps are separate files.)

Westport Island (Pool 25)

Planting of native tree and shrub seedlings. Reforestation of 59 acres of abandoned cropland at sites with ground elevations exceeding 440 feet NGVD is proposed on this 625-acre island. Tree seedlings to be planted would consist of hard mast species such as pin oak (*Quercus palustris*), swamp white oak (*Quercus bicolor*), bur oak (*Quercus macrocarpa*), pecan (*Carya illinoensis*), and Schuette oak (*Quercus x schuettii*, a hybrid between swamp white and bur oak). Native shrub species such as deciduous holly (*Ilex decidua*) and green hawthorne (*Crataegus viridis*) would be planted also. Plant materials would consist of seedlings produced using a root-pruned method, placed on a 30 by 30 foot spacing (49 per acre). [Drawings G-5, C-3, and C-4]

Removal of sediment from island channel. Mechanical dredging of sediment is proposed in a portion of an existing 2,000-foot-long natural channel at the lower end of Westport Island. Sediments totaling 1,535 cubic yards would be removed from 1,000 feet of the channel to provide an additional three feet of channel depth across a channel bottom width of five feet. Dredge material would be side cast within a 0.7-acre disposal area (30 feet wide by 1,000 feet long) sited along the existing channel. [Drawings G-5 and C-2]

Placement of water control structure in island channel. A water control structure consisting of stop logs would be installed in the excavated channel. It is expected that this structure would be constructed off-site. [Drawings G-5 and C-2]

Permanent access road. A 1,265-foot long would be constructed to provide access to the water control structure from the island's edge. The road would be 20 feet wide, and consist of 12-inch thick crushed stone on geotextile fabric. [Drawings G-5 and C-2]

Dardenne Island (Pool 26)

Planting of native tree and shrub seedlings. Planting of tree and shrub seedlings at Dardenne Island would follow the same procedure to be used at Westport Island, except that planting sites in abandoned cropland would be in areas above 428 feet NGVD. Fifty-two acres of plantings are proposed on this 790-acre island. [Drawings G-4, C-3, and C-4]

Bolter Island (Pool 26)

Removal of sediment from island channel. Similar to Westport Island, mechanical dredging of sediment from an existing 1,250-foot-long natural channel at the lower end of Bolter Island (560 acres) is proposed. Sediments totaling 1,900 cubic yards would be removed from the channel to provide an additional

three feet of channel depth across a channel bottom width of five feet. Dredge material would be side cast within a 0.85-acre disposal area (30 feet wide by 1,250 feet) sited along the existing channel. [Drawings G-3 and C-1]

Construction of rock dike structure and excavation of deep hole in island slough. A rock dike structure is proposed to be constructed in an interior slough at the lower end of the island, and a deep hole is proposed to be excavated immediately adjacent to the dike. The rock dike structure would be U-shaped and would consist of 165 tons of graded B stone. Sediments totaling 2,900 cubic yards would be mechanically excavated to a depth of eight feet in a 0.5 acre U-shaped area having a 13-foot wide bottom. Excavated sediments would be placed along either bank of the slough in two disposal areas measuring about 200 by 300 feet each. [Drawings G-3 and C-1]

Temporary access road. A 515-foot long road would be constructed to provide access to the natural channel and interior slough from the island's edge. The road would be 20 feet wide, and consist of 12-inch thick crushed stone on geotextile fabric. [Drawings G-3 and C-1]

III. Description of Existing Environment

A. Topography and Soils The project area's islands lie in the Mississippi River floodplain. These islands are all low, vegetated sedimentary islands. The following table displays the area and ground elevations of the five islands within the project area. Normal elevation of Pool 25 is 434 feet NGVD. Normal elevation of Pool 26 is 419 feet NGVD. The islands exhibit ridge and swale topography. Most of the natural slopes on these islands are less than two percent. The soil surveys for Pike, Lincoln, and St. Charles Counties describe the soils on these islands as alluvial materials consisting of silty clay loams. Howard Island and the unnamed island between it and Mozier Island in Pool 25 are currently experiencing bankline erosion at the upstream end of these islands. This wind-wave erosion is a natural process. Such erosion has not been observed at the other islands in the project area.

Pool	Name of Island	Area (acres)	Range of Ground Elevation (feet NGVD)
25	Howard	43	435 – 440
25	(unnamed)	8	435 – 440
25	Westport	625	435 – 445
26	Dardenne	790	420 – 430
26	Bolter	560	420 – 430

B. Land Cover Forest is the dominant land cover on these islands. Old agricultural fields and water are the other notable types.

C. Socioeconomic Resources The only socioeconomic resource that exists on these islands is a power transmission line that crosses the lower end of Bolter Island. A relatively small amount of commercial fishing occurs in Pools 25 and 26 in the vicinity of the project area's islands. The navigation channel of the Mississippi River supports the navigation industry. Businesses such as recreational marinas and boat clubs that are related to small-boat recreation on Pools 25 and 26 are located along the river's edge in the general vicinity of the project area's islands, as are some private residences.

D. Prime Farmland No farmland currently exists on these islands. Prior to 1993, some lands on Westport and Dardenne Islands (189 and 118 acres, respectively) were cropped by the Missouri Department of Conservation for wildlife purposes, but this activity was terminated after the flood of that year.

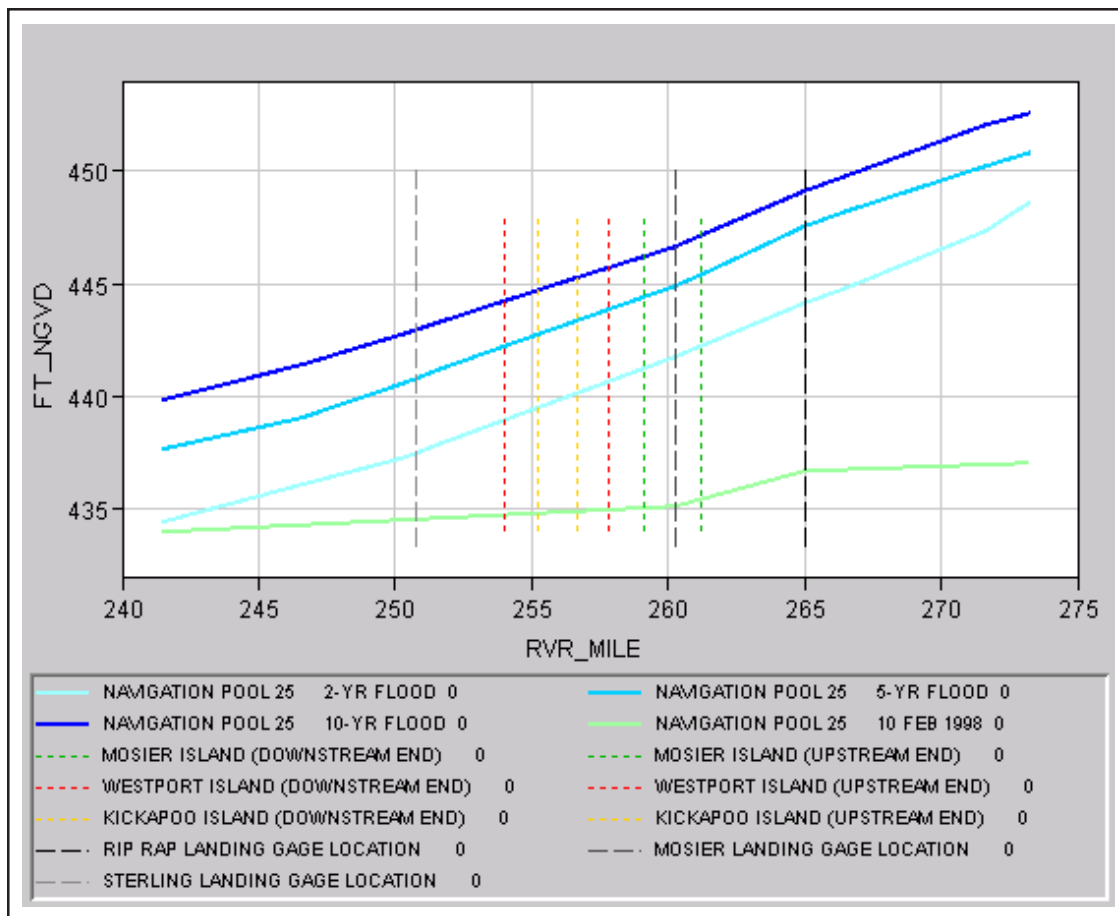
E. Hydrologic Conditions Pools 25 and 26 are part of the navigation system of the Mississippi River. The navigation dams within the St. Louis District are regulated for the purpose of creating pools to provide a

nine-foot depth navigation channel. Land subject to inundation as the result of operation of the navigation dams (such as the project area's islands) was purchased by the Federal government before project operation began. Lock & Dam 25 is located between Mississippi River miles 241 and 242, measured upstream of the mouth of the Ohio River. The drainage area upstream of this structure is about 142,000 square miles. Locks & Dam 26, also known as Melvin Price Locks & Dam, is located between Mississippi River miles 200 and 201, and the drainage area upstream of this structure is about 171,500 square miles.

The mid-pool control point method is used to regulate the navigation pools within the District. The river stage at the mid-pool control point is maintained within the hydraulic regulation limits specified in the water control plan, which is a detailed set of rules and guidelines by which the body of water formed by a hydraulic structure is regulated. In order to maintain the stage at the mid-pool control point within the hydraulic regulation limits, the water-surface elevation at the dam is varied by adjusting the gate openings in response to changes in the flow rate in the river. Medium- to high-flow conditions necessitate low water-surface elevations at the dam. Low-flow conditions necessitate high elevations at the dam. Maintaining the stage at the mid-pool control point within the hydraulic regulation limits assures that adequate navigation depths are maintained throughout the pool (assuming that the river bed has been maintained adequately), and assures that water is only on land purchased for the navigation pools. When flow conditions are such that the nine-foot depth occurs naturally throughout the pool, the gates are taken out of the water. When the gates are out of the water, open-river conditions exist.

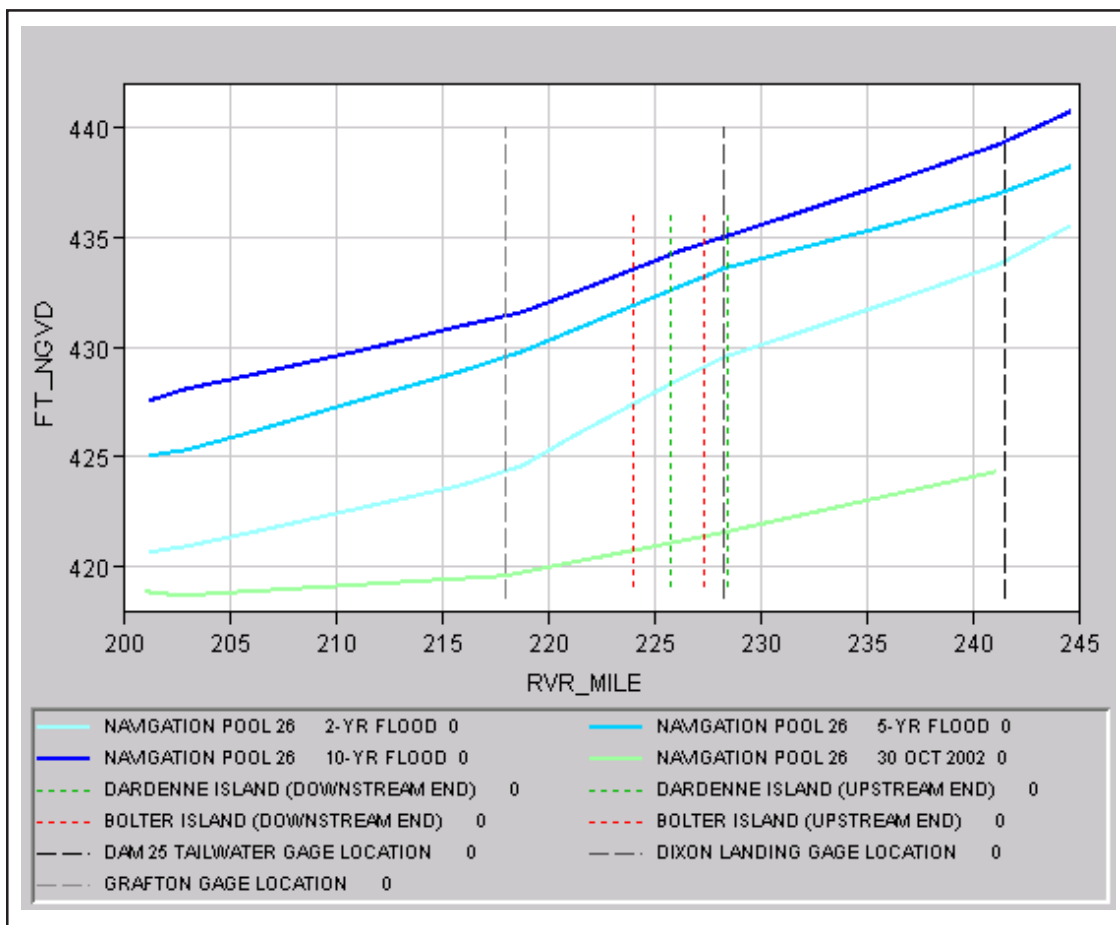
Water-surface profiles for the 2-, 5-, and 10-year frequency flood events in Pool 25 in the vicinity of Mozier and Westport Islands are given in FIGURE EA-3. Hydraulic data for these profiles were taken from USACE (2004a). If or when any of these three frequency flood events would occur, open-river conditions would be in existence at Lock & Dam 25.

FIGURE EA- 3. Pool 25 Hydraulic, Island and Gage Data



Water-surface profiles for the 2-, 5-, and 10-year frequency flood events from Pool 26 in the vicinity of Dardenne and Bolter Islands are given in FIGURE EA-4. Hydraulic data for these profiles were taken from the same U.S. Army Corps of Engineers report cited previously. If or when any of these three frequency flood events would occur, open-river conditions would be in existence at Melvin Price Locks & Dam.

FIGURE EA- 4. Pool 26 Hydraulic, Island and Gage Data



F. Surface Water Resources The major surface water resource in the vicinity of the project area is the Mississippi River. On the islands, the primary surface water resource is sloughs or lake-like bodies of water located on the larger islands. These sloughs would be considered as “water” in terms of a landcover type. Westport Island has about 86 acres of sloughs, including a 74-acre complex of interconnected sloughs located at the lower end of the island. Dardenne Island has several sloughs totaling about 20 acres, Bolter Island has a single slough with a surface area of about 13 acres, and these waterbodies occur on the lower half of these islands.

G. Ground Water Resources Given that the project area’s islands are surrounded by the Mississippi River, ground water occurs on these islands not far below the ground surface. Ground water levels fluctuate with daily and seasonal changes in the river’s elevation. Perched ground water tables are likely to occur in the vicinity of the islands’ sloughs. Ground water on these islands is not used for any purpose.

H. Hazardous, Toxic, and Radioactive Waste An environmental baseline study of the project area’s islands was conducted by the St. Louis District in April 2006 to determine if any hazardous, toxic, or radioactive waste was ever stored, released or disposed of on these properties. A site visit, interviews, and record review did not reveal any evidence of such wastes.

I. Biological Resources The following information about the project area's biological resources is presented under these topics: terrestrial and aquatic habitats, wetlands, refuges, and fish and wildlife species.

1. Terrestrial and Aquatic Habitats The diversity of habitat types on the project area's islands is not high. The main habitat types include bottomland forest and interior sloughs surrounded by this forest. The floodplain forest is composed mainly of soft-seeded tree species such as silver maple, willow, cottonwood, elm, green ash, and hackberry. As a group, these tree species are regenerating successfully. Hard mast tree species such as oaks and hickories are not common, although they once were typical of higher elevations on this and other large Mississippi River islands. Because of the ridge and swale topography common to these islands, stands of hard mast species are usually relatively narrow and linear. Scattered pecans and pin oaks can be found on Westport and Dardenne Islands at higher elevations (440 feet NGVD on Westport, 428 feet NGVD on Dardenne, as determined from site surveys), but at low densities.

Natural regeneration of hard-mast tree species on Westport and Dardenne Islands does not appear to be sufficient to maintain local populations. Besides low numbers of individuals serving as a seed source, other factors related to difficulty in hard-mast tree regeneration include intense competition with fast-growing light-seeded tree species and herbaceous ground cover, slow growth of hard mast seedlings, and flooding and deer herbivory. The flood of 1993 completely inundated the project area's islands for several months, and caused extensive mortality to many tree species. Since then, silver maple has become much more abundant in many floodplain areas, especially at lower elevations.

Erosion occurring at the upstream ends of Howard Island and the unnamed island between it and Mozier Island in Pool 25 is leading to a slow loss of these two islands, with a resulting decrease in mature light-seeded bottomland forest.

The sloughs are classified as "isolated floodplain lake – abandoned channel lake" aquatic habitats (Wilcox 1996), indicating that they normally are not connected to the Mississippi River, except during elevated river stages. These sloughs are usually long and linear and support no aquatic or emergent herbaceous vegetation. At normal pool, water depths average only two to three feet. Areas of greater water depth do not exist. Some sloughs are permanent, whereas a few others dry up during the summer. Water surface elevation in some sloughs appears to be dependent on river stage. The bottom consists of soft sediment. The prolonged flood of 1993 apparently deposited a significant amount of sediment in these sloughs (as well as surrounding forests). Along the margins of these sloughs where the water is shallow, shrub swamps comprised principally of buttonbush (*Cephalanthus occidentalis*) often occur.

Minor terrestrial habitats on these islands include old crop fields on Westport and Dardenne Islands, which were abandoned after the flood of 1993. Since then these crop fields have experienced encroachment by light-seeded tree species, and the process of natural succession to bottomland forest is underway. To counteract this process, the Missouri Department of Conservation (MDC) has attempted to prevent the establishment of woody growth by periodic mowing. In these same areas MDC has also tried to establish a grassy groundcover, with the intent that these old fields would eventually be planted with more desirable species for reforestation. Another minor terrestrial habitat is a forest clearing across Bolter Island along a right of way for a power transmission line, where herbaceous and brushy vegetation occurs. Among minor aquatic habitats are a small side channel ("tertiary side channel"; Wilcox, 1996) at the upstream end of Dardenne Island, much of which has filled in with sediments. A second minor aquatic habitat is a narrow natural channel within the forest on both Westport and Bolter Islands that periodically connects interior sloughs with the river. A portion of each of these natural channels has become choked with accumulated sediments.

2. Wetlands The Corps of Engineers methodology to define and delineate wetlands requires positive indicators for wetland vegetation, soils, and hydrology (USACE-EL 1987). Wetlands subject to Section 404 of the Clean Water Act include essentially all of Howard Island, the unnamed island between Howard and Mozier Islands, Dardenne Island, and Bolter Island. This includes essentially all forest on these islands as

well as all sloughs. On Westport Island, much of the bottomland forest is not considered wetlands because most of the soil identified there by the Natural Resources Conservation Service is classified as not hydric soil. However, there are some low areas of bottomland forest on Westport Island that are supported by hydric soils, and these are wetlands, as are the sloughs.

3. *Refuges* Westport Island Natural Area envelops about 480 acres of the lower half of Westport Island, and was established in 1984 to protect a large undisturbed area of old-growth wet and wet-mesic bottomland forest along with sloughs and shrub swamps. Only minimal man-made alterations are allowed in the natural area.

4. *Fish and Wildlife Species* The project area's islands are located in the Upper Mississippi Conservation Area, a management unit designated by the Missouri Department of Conservation (MDC) that extends from La Grange (Pool 21) to Alton (Pool 26). They are owned by the Corps of Engineers and leased to MDC by the U.S. Fish and Wildlife Service. The principle objective of the Upper Mississippi Conservation Area is to provide optimum habitat for wetland wildlife species. Numerous wildlife species representing birds, mammals, reptiles, and amphibians use the bottomland forests and interior sloughs on these islands as their habitats, either as year round residents or seasonal migrants.

The Mississippi River and floodplain is the center of one of the major flight corridors in North America for migrating birds. Numerous ducks and geese stop during fall and spring to rest, feed and seek sanctuary in wetlands, deepwater habitats and the adjacent floodplain of Pools 25 and 26 (Havera, 1985). In addition to waterfowl, shorebirds, herons, egrets, song birds, and hawks also use these islands as migratory or nesting habitat. The most common game birds, in addition to waterfowl, are the wild turkey, mourning dove, bobwhite quail, American woodcock and crow. Mammals that most likely use the islands include opossum, raccoon, muskrat, mink, fox, beaver, squirrel, cottontail rabbit, white-tailed deer and a variety of bats and mice. These islands are also home to a variety of turtles, snakes, skinks, frogs and toads. Bottomland forest serves as habitat for many of these wildlife species. The hard-mast or nut bearing tree component of these forests provides an important food source to animals such as the white-tailed deer, turkey, squirrels, wood duck, mallard, and pileated woodpecker.

A diverse fish fauna comprised of about 100 species is found in Pools 25 and 26 (Colbert et al., 1975; Sheehan et al., 1990). The five most diverse families are minnows, suckers, sunfishes, perches and darters, and catfishes. Fish obtained commercially include buffalo, channel catfish, carp, flathead catfish, freshwater drum, blue catfish, and carpsucker. Many of these fishes prefer to spawn in backwater or side channel habitats where the current is slow and bottom is muddy or silty. Sunfishes generally prefer to spawn in backwaters and use these areas as general habitat. Some species of fish, such as channel catfish and largemouth bass, are unable to tolerate the cold water temperatures and currents of channel habitats. This is especially true of young-of-the-year fish of these two species and is true to some degree for young-of-the-year fishes of nearly all species that inhabit the river (Sheehan et al., 1990). Backwaters can provide a refuge from harsh winter conditions because they generally have warmer water and little or no current. However, wintering conditions for fish in backwaters can deteriorate rapidly if ice and snow cover is of long duration. During hot summers, deep areas in backwaters can serve as thermal refuges.

Few backwaters in Pools 25 and 26 appear to be optimally suitable as overwintering habitat (Sheehan et al., 1990). The sloughs on the project area's islands are of moderate quality as spawning, rearing, and overwintering habitat for a variety of fish species. However, because of shallow water depths, the suitability of these sloughs as habitat declines in relation to the severity of seasonal extremes (hot summers, cold winters). Agency fisheries biologists recommend that a minimum of eight feet of depth is necessary to safely overwinter fish without a danger of oxygen depletion and the subsequent loss of fish life. In addition to shallow water depths, the amount of time these sloughs are connected to the Mississippi River during the year influences their value as habitat. Because sediments have accumulated in natural channels

that connect many of these sloughs to the river, such sloughs are accessible less frequently than they would be if there were no blockages.

J. Recreation Popular recreational activities in and along Pools 25 and 26 include hunting, fishing, and boating. As part of the Upper Mississippi Conservation Area, the project area's islands are managed by the Missouri Department of Conservation (MDC) to provide quality outdoor recreation experiences to as many people as possible without detrimental effects to them and the surrounding river. Hunting, trapping, fishing, camping, hiking, bird watching, and nature study are encouraged on the conservation area's lands and waters by MDC. These islands are only accessible by boat. No recreational facilities are located on any of them.

K. Aesthetics The project area's islands and the surrounding Mississippi River floodplain are generally rural in nature. Forest is a conspicuous feature on the river's islands, along many reaches of the river's banks, and on the adjacent floodplain. Some existing residential and light commercial development (marinas) is situated on cleared areas along the river's banks in both Missouri and Illinois. Much of this development is scattered, and appears to be experiencing little to no growth. Agriculture is the predominant activity on the adjacent floodplain.

L. Historic Properties The proposed project area includes a total of five islands whose ground surface may be characterized as poorly drained, low-lying floodplain. After rainfall events, much of the ground surface can be covered with ponded or perched water. Inspection of soil series maps revealed that virtually the entire project area is comprised of heavy, lacustrine clays. Prior to the construction of the Mississippi River navigation pools during the first half of the twentieth century, this area consisted of a series of low natural levees separated by numerous water-filled shallow swales. The wet, poorly drained nature of these areas would have been less than ideal conditions for prehistoric or early historic period occupations. Ground cover across the natural levees consisted of flood plain forests. Following completion of the Mississippi River Pools, sedimentation gradually filled in the former swales and deposited a thick layer (in excess of 1 meter) of this material across the floor of the terrestrial forests. It is unlikely that any presently unknown, potentially significant archaeological remains are located within the limits of the project area. However, in the unlikely event that such remains are present, those remains would be deeply buried beneath at least 1 meter of recently deposited sediment.

M. Air Quality Of the six criteria pollutants addressed in the National Ambient Air Quality Standards, the St. Louis metropolitan region is currently in attainment for sulfur dioxide, carbon monoxide, lead, and nitrogen dioxide, but not for particulate matter or ozone. The St. Louis area is currently designated by the U.S. Environmental Protection Agency (USEPA) as not meeting the fine particle standard (PM-2.5), and this includes St. Charles County (USEPA 2006a). The St. Louis area is also designated by the USEPA as not meeting the eight-hour ozone standard, and levels of this pollutant are classified as moderate; the nonattainment area includes St. Charles County (USEPA 2006b). Pike and Lincoln Counties in Missouri are in compliance with all of the six criteria pollutants.

N. Noise As the project area's islands are located either at a distance or on the periphery of the St. Louis metropolitan area in a rural setting, noise is comparatively minimal. The main source of noise comes from watercraft on the river, including the towing industry and recreational vessels. Compared to watercraft, land-based transportation noise from railroads, major highways, and secondary roads is very minimal.

IV. Future Without Project (No Action)

The Corps consideration of the future requires the forecasting of conditions without any project. A 50-year planning horizon was used. A number of assumptions were made about what the project area and vicinity would be like 50 years in the future without any project. One chief assumption was that water levels in Pools 25 and 26 would continue to be managed at the locks and dams as they are now, and that there would be no change in normal pool elevation.

Floodplain forests along the Mississippi and Illinois Rivers of the Upper Mississippi River System (UMRS) are currently declining in spatial extent and in species diversity (Urich et al. 2002). As of 1989, UMRS floodplain forests consisted of a variety of major community types, including mixed-silver maple (about 80%), oak-hickory (10%), willow and cottonwood (5% combined), and shrub, plantation, and swamp cypress (5% combined) (USGS 1999). The oak-hickory communities have experienced significant system-wide spatial losses since settlement (USGS 1999, Urich et al. 2002). These hard-mast dominated forests are not distributed evenly along the floodplain from north to south. In Pool 26, they represent about 10% (roughly 2,000 acres) of the total forest, whereas in Pool 25, oak-hickory communities are not found (USGS 1999). Planting of mast tree species in suitable sites is recommended to sustain this important natural resource (Urich et al. 2002).

Without active planting at suitable elevations, existing mast tree populations on the project area's islands are not expected to sustain themselves in the long term. A variety of light-seeded tree species such as silver maple, cottonwood and willow are expected to reforest areas of abandoned cropland over the next 50 years, including sites of suitable elevation for hard-mast plantings.

Aquatic habitats of the UMRS have also changed since historic times due to construction of the locks and dams as well as levees, regulation of water levels in the pools, maintenance of the navigation channel, and development of the floodplain. The deposition of suspended sediments in off-channel habitats has degraded backwaters and side channels by reducing water depths, and this has led to an overall decline in aquatic habitat diversity (USGS 1999). To maintain a sustainable aquatic ecosystem, habitat needs have been identified for the reach of the Mississippi River that includes Pools 25 and 26. These needs include, among other items, the creation or restoration of backwaters, specifically 5,000 acres of isolated backwater habitat in Pools 14-26 (USACE, 2000a), much like the sloughs on the project area's islands. USACE (2000a) also calls for the creation or restoration of 3,000 acres of island habitat in this same river reach.

Recent sedimentation rates in backwater areas of Pools 25 and 26 are estimated to be about 0.3 centimeters per year (about 0.1 inch) (WEST Consultants, Inc. 2000a). Assuming this rate over the next 50 years, about 15 centimeters (six inches) of additional sediments are expected to accumulate in the sloughs of the project area's islands. Average water depth in these sloughs would decline to about 1.5 to 2.5 feet. These sloughs would function in the future less often as suitable fish spawning, rearing, and overwintering habitat, and would be expected to be more likely to experience winter and/or summer fish mortality due to oxygen depletion.

Wind and wave erosion of the unstable islands in the project area (Howard Island and the unnamed island) is expected to continue. The net change in area of these islands projected over the next 50 years is estimated to be a loss of one percent. Estimates of overall island area change for Pools 25 and 26 are +2% and 0%, respectively (WEST Consultants, Inc. 2000a).

V. Environmental Effects of the Alternatives Considered and Recommended Plan

The probable environmental, social, and economic effects of the recommended plan and other action alternatives that were considered in detail are described below, and summarized in TABLE EA-3. The table also reflects the effect of the no-action alternative (doing nothing). These effects are forecasts of conditions over the next 50 years.

A. Topography and Soils None of the action alternatives would create significant changes to topography or soils on the project area's islands. The recommended plan (Alternative 4) would create a 0.5-acre deep hole in the slough on Bolter Island, and Alternatives 5-8 would create one to three additional deep holes of similar size on Westport and Dardenne Islands. Erosion control measures would be implemented to stabilize mechanically dredged sediments removed from the natural channels on Westport and Bolter Islands, and from the sloughs and small sidechannel on Westport and Dardenne Islands. These measures would consist of seeding of stockpiled sediments with quick-germinating grasses, and placement of silt fences around the

TABLE EA-3. Summary of probable impacts of the No Action and eight Action Alternatives. Recommended plan (shaded), 0 no change, + beneficial effect, - adverse effect, * temporary effect

Impacts	ALTERNATIVES								
	NO ACTION	1	2	3	4	5	6	7	8
ENVIRONMENTAL									
Terrestrial Resources	0	0	+	++	++	++	++	++	+++
Wetland Resources	0	+	+	++	+++	+++	+++	+++	+++
Aquatic Resources	0	+	+	+	++	++	++	+++	+++
T & E Species	0	0	0	0	0	0	0	0	0
Topography and Soils	0	0	0	0	0	0	0	0	0
Hydrology	0	+	+	+	++	++	++	++	++
Water Quality	0	-*	-*	-*	--*	--*	--*	--*	---*
Climate	0	0	0	0	0	0	0	0	0
Erosion and Sedimentation	0	0	0	0	0	0	0	0	+
Air Quality	0	-*	-*	-*	--*	--*	--*	--*	---*
Noise	0	-*	-*	-*	--*	--*	--*	--*	---*
Hazardous and Toxic Materials	0	0	0	0	0	0	0	0	0
Agricultural Resources	0	0	0	0	0	0	0	0	0
SOCIAL									
Land Use	0	0	0	0	0	0	0	0	0
Cultural Resources	0	0	0	0	0	0	0	0	0
Environmental Justice	0	0	0	0	0	0	0	0	0
Flood Damage Reduction	0	0	0	0	0	0	0	0	0
Aesthetics	0	-*	-*	-*	--*	--*	--*	--*	---*
Public Facilities	0	0	0	0	0	0	0	0	0
Public Services	0	0	0	0	0	0	0	0	0
Safety	0	0	0	0	0	0	0	0	0
Recreation	0	0	+	+	++	++	++	+++	+++
ECONOMIC									
Employment	0	+	+	+	++*	++*	++*	++*	+++*
Tax Values	0	0	0	0	0	0	0	0	0
Property Values	0	0	0	0	0	0	0	0	0
Community Cohesion	0	0	0	0	0	0	0	0	0
Displacement of People	0	0	0	0	0	0	0	0	0
Displacement of Businesses	0	0	0	0	0	0	0	0	0
Disrupt of Comm. Growth	0	0	0	0	0	0	0	0	0
Disrupt of Regional Growth	0	0	0	0	0	0	0	0	0
Operations and Maintenance	0	-	--	--	---	---	---	---	---

perimeter of disposal sites. Areas where barren ground surfaces are created would be seeded with a mixture of grasses and returned to pre-project conditions.

B. Land Cover No significant changes to land cover on the project area's islands are expected. Without any project, the 307 acres of abandoned cropland on Westport and Dardenne Islands are expected to undergo natural succession and become forest. Alternatives 2-8 would facilitate this process by planting hard mast tree species on higher elevations. Alternatives 1-8 would involve relatively small amounts of tree clearing (up to about 10 acres) to facilitate construction. The recommended plan (Alternative 4) would require about 5 acres of tree clearing.

C. Socioeconomic Resources The recommended plan and other alternatives would not adversely affect any local socioeconomic resources, including land use, public facilities or services, private property, or nearby communities or businesses. Temporary benefits in employment would be expected because of the short-term construction activities associated with Alternatives 1-8. Operations and maintenance activities are associated with each of the action alternatives, including the recommended plan. These activities require funding and would be needed over the 50-year life of the project. They include items such as periodic operation of the water control structure on Westport Island, periodic removal of competing vegetation from the immediate vicinity of planted seedlings, periodic removal of woody debris from sloughs at the junction with natural channels that connect them to the river, and eventual replacement of the water control structure on Westport Island. These costs would be the responsibility of the project's non-Federal sponsor, the Missouri Department of Conservation.

D. Prime Farmland No prime farmland would be affected by the recommended plan or any of the other alternatives that were considered.

E. Hydrologic Conditions None of the action alternatives would adversely affect hydrologic conditions in Pools 25 and 26. Alternatives 1-8 would improve the natural hydrologic connection between the Mississippi River and the slough complex on Westport Island by removing accumulated sediments from the connecting channel, and Alternatives 4-8 would also improve the connection between the river and single slough on Bolter Island. During sediment removal from these connections, the affected area would be reshaped to form a narrow channel designed to convey flow to and from the slough at velocities high enough to minimize redeposition of sediments. With regard to the water control structure on Westport Island (Alternatives 1-8), this structure would be kept open most of the time, but would be closed periodically when the river is elevated (below a 5-year event) to hold water in the island's slough complex once the river recedes. With this structure closed, maximum ponding elevation for this slough complex would be about 435 feet NGVD. The rock dike structures of Alternatives 4-8, proposed at Westport Island or Bolter Island to maintain depth in the deep hole, are designed to be overtopped by about a 5-year event on the Mississippi River.

F. Surface Water Resources All of the action alternatives propose to make changes to one or more surface water resources on the project area's islands. Mechanical dredging of sediments from natural channels to improve the hydrologic connection between the Mississippi River and the slough complex on Westport Island and the single slough on Bolter Island is not expected to lead to a lowering of the water surface of these sloughs, because normal surface elevation of these waterbodies is about equal to the normal pool (river) elevation. For the same reason, creation of a deep hole in the single slough on Westport Island or Bolter Island is not expected to establish a more direct connection with groundwater, which could potentially lead to a lowering of the surface elevation of these waterbodies.

G. Ground Water Resources No ground water resources will be affected by any of the considered alternatives.

H. Hazardous, Toxic, and Radioactive Waste Because no HTRW sites have been identified on the project area's islands, it is unlikely that there is a potential for construction activities associated with any of the proposed action alternatives to disturb any such wastes. Mechanically dredged sediments to be removed from sloughs and natural channels are unlikely to consist of any HTRW materials, because these sediments have been deposited over time by reoccurring Mississippi River floods.

I. Biological Resources The following information about the project area's biological resources is presented under these topics: terrestrial and aquatic habitats, wetlands, refuges, and fish and wildlife species.

1. Terrestrial and Aquatic Habitats Alternatives 2-8 would improve terrestrial habitat on the project area's islands by reforesting 110 of the 307 acres of abandoned cropland on Westport and Dardenne Islands with various hard-mast tree species. A few species of native shrub species would also be planted to add diversity to the restored forest community. All available high ground occurring in these abandoned crop

fields would be planted. Elevations at these planting sites correspond to those where scattered remnant hard-mast trees exist in adjacent forest. Seedlings to be planted, produced in a nursery by a root-pruned method, are capable of bearing nuts in the field when they reach 5 to 10 years of age. These plantings would be vital in restoring the important oak-hickory communities currently lacking in the floodplain forest on these islands, and which are also underrepresented in Pools 25 and 26. Tree species diversity would be restored, which otherwise would not occur through natural succession.

Prior to planting, minor clearing of woody encroachment by light-seeded tree saplings is expected at some planting sites. Also, some tree clearing would be necessary for other construction activities associated with Alternatives 1-8, and this would affect forested wetlands. These impacts are described below under the heading for wetlands. These tree clearing impacts are not reflected in TABLE EA-3.

Alternative 8 (only) would halt the terrestrial erosion and loss of land at Howard Island and the unnamed island near it. Protection to the island afforded by bank stabilization activities would preserve an estimated 0.5 acre of floodplain forest over the next 50 years. Access to Bolter Island (Alternatives 4-8) would involve construction of a temporary crushed stone road in the existing forest clearing under the power transmission line.

Alternatives 1-8 would counteract the effects of continuing sedimentation in aquatic habitats on Westport or Bolter Islands by enhancing the connectivity of island sloughs with the Mississippi River, or by creating 0.5-acre deep holes on Westport, Dardenne, or Bolter Islands. Periodic operation (closure) of the water control structure on Westport Island (Alternatives 1-8) would hold the water level in the 72-acre slough complex in a perched condition while the river is falling. Closure of this structure by the Missouri Department of Conservation would likely take place in the late spring or early summer once every two to three years, and the structure would likely be reopened no later than late summer. When the structure would be closed, perched water levels in the sloughs could be about one to two feet higher than the adjacent river, depending on pool stage and the rate of river fall.

2. Wetlands The wetland impacts summarized in TABLE EA-3 for all alternatives are long-term effects, and do not reflect adverse impacts due to construction activities. Long-term effects on wetlands are expected to be beneficial, and include reforestation of 52 acres of wetlands (abandoned cropland) on Dardenne Island (Alternatives 3-8), and increased hydrologic connectivity between the Mississippi River and interior sloughs on Westport (Alternatives 1-8) and Bolter Islands (Alternatives 4-8). Abandoned cropland on Westport Island proposed for hard-mast tree planting is not considered wetland because of the absence of hydric soils in these areas.

The recommended plan (Alternative 4) is expected to adversely affect about 5.25 acres of forested wetlands. Disposal sites for mechanically dredged sediments would affect about 4.3 acres of wetlands, and access roads would affect an additional 0.85 acres. Wetlands used for disposal of dredge material would either remain forested (with material placed in between trees), or would be cleared for disposal, and trees would be allowed to grow back on the stockpiled material (which would range in depth from about 0.65 to 1.5 feet). Tree clearing for crushed stone access roads would be minimal; the road on Westport Island would be permanent, whereas the other on Bolter Island would be temporary. The planting of 52 acres of tree and shrub seedlings in wetlands (abandoned cropland) on Dardenne Island is expected to offset the temporary and permanent impacts associated with construction activities affecting these wetlands.

Additional adverse effects on wetlands are expected for Alternatives 5-8, including creation of additional dredge disposal areas in wetlands on Westport Island (probably low-lying abandoned cropland) for sediments obtained from creating a deep hole in additional sloughs as well as cropland. These adverse effects would probably involve several additional acres of wetlands.

3. Refuges Alternatives 1-8 all involve the same construction activities within the Westport Island Natural Area. These include the proposed mechanical excavation of sediments from the natural channel

linking the river with the island's interior slough complex, placement of a water control structure in this natural channel, and construction of a permanent stone access road from the river through bottomland forest to the water control structure. According to the Missouri Department of Conservation, these activities are allowable in this natural area. The proposed tree planting on Westport Island is outside of the natural area.

4. Fish and Wildlife Species Wildlife species expected to benefit from the hard-mast tree plantings once they mature on Westport (Alternatives 2-8) and Dardenne (Alternatives 3-8) Islands include those whose diet includes the acorns and nuts of various native oaks and hickories, such as deer, turkey, squirrels, and pileated woodpeckers. Waterfowl such as mallards and wood ducks are expected to occasionally feed in these planted areas also.

Aquatic species, especially riverine fishes, are expected to benefit from the removal of sediments to reopen the natural channels connecting the Mississippi River with sloughs located on Westport (Alternatives 1-8) and Bolter (Alternatives 4-8) Islands. Fishes that are expected to spawn and rear young in these sloughs include such species as all members of the sunfish family (including sport fish such as bluegill, largemouth bass, white and black crappie) and gizzard shad. Periodic closure of the water control structure on Westport Island (Alternatives 1-8) by the Missouri Department of Conservation during the late spring and early summer once every two to three years would likely prevent fish in the river from accessing the island for spawning. However, perched slough conditions during closure would provide somewhat deeper water depths for spawning fish already in the slough complex as well as young of the year using this area as a nursery.

Riverine fishes are also expected to benefit from the creation of 0.5-acre deep holes on Bolter Island (Alternatives 4-8), Westport Island (Alternatives 5-8), and Dardenne Island (Alternatives 7-8). Fish of all ages, including young of the year as well as juveniles and adults, would be expected to use these deep holes as thermal refuges during stressful periods (hot summer, cold winters). Species known to use deep areas in backwaters for overwintering include sport species (such as black crappie, white crappie, white bass, bluegill) and commercial species (such as freshwater drum), as well as gizzard shad (Sheehan et al., 1990).

K. Recreation Recreational opportunities on the project area's islands are expected to improve under Alternatives 2-8. Improved opportunities are expected in the future for hunting on Westport and Dardenne Islands (concurrent with eventual nut production from hard-mast tree plantings), and for fishing on Dardenne and Bolter Islands in the vicinity of the deep holes.

L. Aesthetics Temporary adverse effects on aesthetics are expected in the vicinity of the project area's islands under all action alternatives. The presence of land-based or water-based heavy construction equipment on the islands or adjacent river is expected to adversely affect aesthetics. The clearing of relatively small areas of trees is also expected to be an adverse effect. These effects are expected to be temporary, and last as long as equipment is onsite, or trees have grown back on dredge material disposal sites. The long-term presence of a rock dike structure on Westport, Dardenne, and Bolter Islands is expected to have a minimal adverse effect; herbaceous and woody vegetation is expected to take root on these structures and hide or screen them from view. Bank stabilization materials placed at the upstream ends of Howard Island and the unnamed islands would be very similar to those currently existing on adjacent islands, such as Mozier.

M. Historic Properties Construction activities associated with the proposed restoration and re-introduction of historically documented, native forest tree cover is unlikely to have any effect upon potentially significant archaeological remains. The highest elevations above the existing navigation normal pool level within the project area reveal that the water table will be within 1 meter of the existing modern ground surface. Previous investigations suggest that any presently unknown, potentially significant archaeological remains are buried at least 1 meter below the present ground surface. The root systems of the proposed deciduous trees (to be re-introduced across the project area) generally do not permeate saturated sediment zones.

In addition to tree planting, proposed project improvements also include removal of recent sediment from several swales to facilitate the restoration of annual wet-dry river stage cycles – required by a host of wetland vegetation species. Both the recommended tree planting and drainage improvements will require the use of heavy machinery. Despite the fact that virtually all of the proposed disturbance and staging activities will occur within the “recent deposition” levels of the project area, such earthmoving activities will be monitored on-site by a professional archaeologist to insure that no potentially significant archaeological remains are inadvertently disturbed by these activities. Therefore, it has been determined that the proposed environmental plantings should have no effect upon any potentially significant archaeological remains.

N. Air Quality All considered alternatives would have temporary adverse impacts to air quality due to construction activities. The effects would be restricted to exhaust and dust from construction activities. These impacts would cease once construction was completed. Cleared trees would be disposed of onsite rather than burned to minimize air quality impacts.

O. Noise The considered alternatives and recommended plan are not expected to significantly affect the noise levels in the study area. Noise impacts would be temporary and caused by construction activities and machinery.

VI. Relationship of the Proposed Project to Land-Use Plans

The recommended plan (Alternative 4) is consistent with the St. Louis District’s Rivers Project Master Plan (dated July 2001) that addresses management of the natural, cultural and recreation resources on Federal lands and waters associated with Mississippi River Navigation Pools 25 and 26. It is also consistent with the Missouri Department of Conservation’s management plans for the Upper Mississippi Conservation Area.

VII. Adverse Effect Which Cannot Be Avoided

A minor effect is the clearing of about five acres of trees to create space for the disposal of dredged sediments. Other unavoidable impacts include temporary generation of noise, dust, and exhaust by construction equipment, and temporary aesthetic impacts due to tree clearing and the presence of construction equipment.

VIII. Short-Term Use Versus Long-Term Productivity

The recommended plan’s short-term use of the environment is small compared to the long-term productivity expected to be gained after implementation.

IX. Irreversible or Irretrievable Resource Commitments

Aside from the commitment of funds and labor for the formulation of alternatives and selection of a recommended plan, there would be no irreversible or irretrievable resource commitments.

X. Cumulative Impacts

The effects of the recommended plan are to be considered in light of the effects of other activities and development in the project area. The Council on Environmental Quality defines cumulative effects as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time” (40 Code of Federal Regulations, Section 1508.7).

This cumulative impacts analysis considers those past, present, and reasonably foreseeable future actions that have a similar or related purpose to that of the recommended plan (i.e. habitat restoration), or that have effects on the same resource (i.e., backwaters and hard-mast component of floodplain forest).

A. Past Actions Past actions include all development activities that have affected the Mississippi River and its floodplain in the area of Pools 25 and 26 since European settlement about two centuries ago. These activities are numerous, but the most significant actions are the construction of the navigation system, including Locks and Dams 25 and 26 in the late 1930s, and subsequent maintenance of the 9-foot channel project. Today's river environment reflects a degraded condition, and unlike the historic condition, the system has a limited ability to recreate new backwater areas, most of which are subjected to sedimentation. Over the last century large areas of floodplain forest have been cleared for agriculture and development, especially higher areas supporting hard-mast tree communities. Many remaining areas of hard mast trees have suffered from altered hydrology due to creation of the navigation pools. Cumulative environmental effects of past actions have been discussed by USGS (1999) and WEST Consultants, Inc. (2000a, 2000b). EMP-HREP projects that have been completed by the St. Louis District include Stag Island (1999, river miles 248-249.5) in Pool 25, and Dresser Island (1991, river miles 205.5-209) and Cuivre Island (1999, river miles 235-238) in Pool 26. Creation of overwintering backwater habitat was a primary purpose at Stag Island and a secondary one at Cuivre Island. Planting of hard-mast tree species was a primary objective at Cuivre Island.

B. Present Actions Batchtown and Calhoun Point are two additional EMP-HREP projects that are nearly completed. The former, located in Pool 25 (river mile 242.5-246), and the latter, in Pool 26 (219.5-223.5), will both protect backwater habitat, and creation of deepwater overwintering habitat is a focus at Calhoun Point. Planting of hard-mast tree species is an objective at both project sites.

C. Reasonably Foreseeable Future Actions Sandy Slough is a candidate EMP-HREP project in Pool 25 (river mile 241.5-245) that would restore spawning and rearing habitat in an off-channel area. Although interagency plans addressing specific localized habitat needs for fish and wildlife have yet to be developed for navigation pools 24-26, it is likely that additional future projects will be deemed necessary to address backwater degradation and the need for floodplain forest restoration in the system.

The recommended plan for the Pools 25 and 26 Islands EMP-HREP project would provide long-term benefits to a variety of riverine fishes and terrestrial wildlife using Westport, Dardenne, and Bolter Islands and environs. This plan is expected to complement similar projects at other areas in Pools 25 and 26. From a systemic approach, the recommended plan represents an incremental step in achieving pool-wide habitat needs for fish and wildlife of the Upper Mississippi River.

XI. Federally Listed Species - Biological Assessment

In compliance with Section 7(c) of the Endangered Species Act of 1973, as amended, the St. Louis District requested that the U. S. Fish and Wildlife Service (USFWS) provide a listing of Federally threatened or endangered species, currently classified or proposed for classification, that may occur in the vicinity of the Pools 25 and 26 Islands project. The USFWS provided the following list of species (personal communication, Mike Thomas, Marion Illinois suboffice, March 7, 2006). The USFWS also indicated that there is no designated critical habitat in the project area at this time.

Lincoln County (Pool 25, Howard and unnamed Islands, and Westport Island):

Bald eagle (*Haliaeetus leucocephalus*) - threatened

Indiana bat (*Myotis sodalis*) - endangered

Spectaclecase mussel (*Cumberlandia monodonta*) - candidate

St. Charles (Pool 26, Dardenne and Bolter Islands):

Bald eagle (*Haliaeetus leucocephalus*) - threatened

Indiana bat (*Myotis sodalis*) -endangered

Eastern massasauga (*Sistrurus catenatus catenatus*) - candidate

Pallid sturgeon (*Scaphirhynchus albus*) - endangered

Decurrent false aster (*Boltonia decurrens*) - threatened

Running buffalo clover (*Trifolium stoloniferum*) – endangered

Bald eagle: Bald eagles winter along the major rivers of Illinois and Missouri, and at scattered locations some remain throughout the year to breed. Perching and feeding occurs along the edge of open water, from which eagles obtain dead fish. The pooled portion of the Upper Mississippi River, including pools 25 and 26, can receive high eagle use, specifically in the vicinity of locks and dams during cold winters where the river is relatively ice free. No nesting is known to occur in the vicinity of the islands on which work is proposed.

Removal of small trees from the abandoned cropland areas for tree planting preparation, and removal of a few scattered large trees associated with channel excavation on Westport and Bolter Islands, will not affect any perching, feeding, or roosting habitat. Therefore, the project is unlikely to affect this species.

Indiana bat: Indiana bats winter in caves or mines, but none of these features occur on the islands proposed for work. Females use trees in floodplains and upland areas in the summer months as nursery roosts, and forage for insects in the tree canopy. Trees preferred for maternity roosting have included dead individuals of species having shaggy or loose bark; diameters at breast height of such trees are often greater than 10 inches. Live trees with loose bark or possessing cavities are used less often. Males have also been known to roost in similar trees.

Clearing of small trees for tree planting preparation in abandoned agricultural fields will not affect any roosting habitat. Removal of a few scattered large trees associated with channel excavation on Westport and Bolter Islands will be restricted to the colder months when maternity roosting is not known to occur (September 1 through April 30). With this restriction, the proposed project is unlikely to affect this bat.

Spectaclecase. The spectaclecase is a large mussel attaining 9 to 10 inches in length. Habitats are found in medium to large rivers with low to high gradients, and include shoals (areas of shallow water) and riffles with slow to swift currents over coarse sand and gravel. Substrates sometimes consist of mud, cobble, and boulders. The range for this species includes the middle and upper Mississippi River (Cummings and Mayer, 1992). Oesch (1995) displayed two records from the Mississippi River near Clarksville. In an assessment of the status of population viability at known locations of occurrence across its range, USFWS (undated) considered all spectaclecase populations in the Mississippi River in Illinois and Missouri to be either extirpated or “non-viable or unknown”; none were classified as having “some evidence of viability”. Habitat destruction and degradation are the chief causes of imperilment, including reservoir construction, channelization, chemical contaminants, mining, and sedimentation.

The interior slough on Bolter Island and the natural channels on Bolter and Westport Islands do not provide suitable habitat for this species. The proposed channel excavation and creation of a deep hole are not likely to adversely affect the spectaclecase mussel.

Eastern massasauga rattlesnake. This snake is recorded as occurring from St. Charles County, Missouri, on the floodplain between the river and uplands. The massasauga or swamp rattler historically lived in prairies of the Midwest, apparently in the wetter areas, and today inhabits old fields, floodplain forests, marshlands, and bogs. It

is active from April through October, and often suns on clumps of grass, in branches of small shrubs, or near crayfish burrows. It feeds on small rodents. The snake can withstand submersion in water for brief periods of time. Massasaugas breed in spring, and four to 20 young are born in late summer or early autumn.

Although suitable habitat for this snake is available, this snake is not known to occur on Bolter and Westport Islands. Therefore the proposed activities are not likely to adversely affect this species.

Pallid sturgeon: This fish is found in the Mississippi River downstream of its confluence with the Missouri River. USACE (2004b) considers its range to extend upstream to the tailwaters of the Mel Price Lock and Dam. The entire stretch of river below Mel Price Lock and Dam is considered potential habitat. Little is known of its habitat preferences. Pallid sturgeon are most frequently caught over a sand bottom, which is the predominant bottom substrate within the species' range on the Mississippi River. Pallid sturgeons have been found in water 1.2 to 7.6 meters deep with velocities of 0.33 to 90 centimeters per second (USFWS, 1993). Recent tag returns have also shown that the species may be using a range of habitats in off-channel areas, including tributaries, of the Mississippi River.

Because the pallid sturgeon is not known from Pools 25 and 26, the proposed work is unlikely to affect this species.

Decurrent false aster: The decurrent false aster is presently known from scattered localities on the floodplains of the Illinois River, and Mississippi River from its confluence with the Missouri River south to Madison County, Illinois. Its natural habitat was the shores of lakes and the banks of streams. It appears to require abundant light. Populations presently grow on stream banks and lake shores, but are more common in disturbed lowland areas where they appear to be dependent on human activity for survival (USFWS, 1990).

Because this species is not known from either Bolter or Westport Islands, the proposed project is unlikely to affect this species.

Running buffalo clover. This plant, a native clover of Missouri, is believed to have originally inhabited the ecotone between open forest and prairie in the eastern and central U.S. The species apparently depended on grazing and disturbance by large animals such as the buffalo for population viability, and partial shading also appears to have been an important component of its original habitat. Current habitats include disturbed bottomland meadows and areas with rich moist soils that are subjected to mowing, trampling, or grazing, especially disturbed areas in woodlands. Running buffalo clover is known from 24 counties in Missouri.

Because running buffalo clover is a terrestrial species, the proposed excavation in the Mississippi River is not likely to adversely affect this species. The proposed tree planting is also not likely to adversely affect this species.

Summary: Based on our evaluation, it is the St. Louis District's opinion that the proposed project will not adversely impact any of the five threatened or endangered species or two candidate species, provided that tree felling is restricted to the time of the year (September 1 through March 31) when Indiana bat maternity colonies are not present. Likewise, the action will not affect any critical habitat of these species. The USFWS will be given an opportunity to review this EA and comment on this Biological Assessment.

XII. Relationship of Plans to Environmental Laws and Regulations

Federal Laws and Policies	Compliance
Bald Eagle Protection Act, 42 USC 4151-4157	Full
Clean Air Act, 42 USC 7401-7542	Full
Clean Water Act, 33 USC 1251-1375	Partial 1/
Comprehensive Environmental Response, Compensation, and Liability Act, 42 USC 9601-9675	Full
Endangered Species Act, 16 USC 1531-1543	Full
Farmland Protection Policy Act, 7 USC 4201-4208	Not applicable
Fish and Wildlife Coordination Act, 16 USC 661-666c	Full
Food Security Act of 1985, 7 USC varies	Full
Land and Water Conservation Fund Act, 16 USC 460d-460l	Full
National Environmental Policy Act, 42 USC 4321- 4347	Full
National Historic Preservation Act, 16 USC 470 et seq.	Partial 2/
Native American Graves Protection and Repatriation Act, 25 USC 3001 et seq.	Partial 2/
Noise Pollution and Abatement Act, 42 USC 7691-7642	Full
Resource, Conservation, and Rehabilitation Act, 42 USC 6901-6987	Full
Rivers and Harbors Appropriation Act, 33 USC 401-413	Full
Water Resources Development Acts of 1986 and 1990	Full
Floodplain Management (EO 11988 as amended by EO 12148)	Full
Prevention, Control, and Abatement of Air and Water Pollution at Federal Facilities (EO 11282 as amended by EO's 11288 and 11507)	Full
Protection and Enhancement of Environmental Quality (EO 11991)	Full
Protection and Enhancement of the Cultural Environment (EO 11593)	Full
Protection of Wetlands (EO 11990 as amended by EO 12608)	Full

Full compliance: Having met all requirements of the statute for the current stage of planning

Not applicable: Compliance with the statute not required

1/ The project requires an individual Section 404 permit and water quality certification from the Missouri Department of Natural Resources, which will be sought during review of EA.

2/ Full compliance to be achieved with the State Historic Preservation Officer's concurrence in the District's EA conclusions. If human remains are found, all laws will be followed.

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XIV. Coordination, Public Views, and Responses

Prior to the preparation of this Environmental Assessment, the proposed Pools 25 and 26 Islands project has been coordinated with the Missouri Department of Conservation, U.S. Fish and Wildlife Service (USFWS), and 21 Native American tribes, by meetings, telephone, and written correspondence. The USFWS prepared a draft Fish and Wildlife Coordination Act Report on May 12, 2006.

This Environmental Assessment and Draft Unsigned Finding of No Significant Impact are being sent to the following elected officials, agencies, organizations and individuals for review and comment. All responses will be filed with this document. To assure compliance with the National Environmental Policy Act, Endangered Species Act and other applicable environmental laws and regulations, coordination with these agencies will continue as required throughout the planning and construction phases of the proposed project.

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XV. Preparers of Environmental Assessment

Staff members of the St. Louis District responsible for preparing or contributing to this document include:

Mr. Tim George, Ecologist

Role: Plan Formulation, Habitat Evaluation, Incremental Cost Analysis, Environmental Impact Analysis, Endangered Species Assessment, 404(b)(1) assessment

Dr. Terry Norris, Archaeologist

Role: Archaeology/Historic Properties Sites Evaluation

Mr. Kip Runyon, Fisheries Biologist

Role: Plan Formulation, Habitat Evaluation, Incremental Cost Analysis, Environmental Impact Analysis

Mr. Ray Kopsky, Hydraulic Engineer

Role: Hydrology and Hydraulics

Mr. Richard Archeski, Environmental Engineer

Role: Hazardous, Toxic, and Radioactive Waste Assessment

XVI. Draft (unsigned) Finding of No Significant Impact (FONSI)

A. I have reviewed and evaluated the Environmental Assessment and other documents concerning proposed habitat rehabilitation and enhancement for the Pools 25 and 26 Islands project, conducted under the Upper Mississippi River System-Environmental Management Program. The project area's islands are located in Navigation Pools 25 and 26, St. Charles, Lincoln, and Pike Counties, Missouri.

B. As part of this evaluation, I have considered:

1. Existing resources and the no-action alternative.
2. Impacts to existing resources with all formulated plans, including the recommended plan.

C. The possible consequences of these alternatives have been studied for physical, environmental, cultural, social and economic effects, and engineering feasibility. My evaluation of significant factors has contributed to my finding:

1. The recommended action will increase the spatial extent of the oak-hickory community of floodplain forests on Westport and Dardenne Islands, will restore the natural connections between the Mississippi River and interior backwater habitats on Westport and Bolter Islands, and will create and maintain deepwater habitat in the interior slough on Bolter Island.
2. There would be no significant effects to the geology, groundwater, or topography of the project area.
3. Inducement of development in the flood plain would not result from this recommended action.
4. No impacts are expected to the floodway of the Mississippi River.
5. Federally listed endangered, threatened, or candidate species would not be adversely impacted.
6. There would be no adverse impacts to cultural resources.
7. There would be no effect to farmland, nor any conversions of land to nonagricultural use.
8. There would be no appreciable degradation to the physical environment (e.g., noise, air quality, and water quality) due directly to the recommended action.
9. No significant adverse impacts to the aesthetic value, social, or recreational resources would result.
10. The proposed project would not result in the net loss of any wetlands.

D. Based on the disclosure of impacts contained within this Environmental Assessment, I find no significant impacts to the human environment are likely to occur as a result of the proposed action. The proposed action has been coordinated with the appropriate resource agencies and the public, and there are no significant unresolved issues. Therefore, an Environmental Impact Statement will not be prepared prior to proceeding with the recommended plan for the Pools 25 and 26 Islands project.

Date

Lewis F. Setliff III
Colonel, Corps of Engineers
District Engineer

Section 404(b)(1) Evaluation Report on the Effects of the Discharge of Dredged or Fill Material Into Waters of the United States

Pools 25 & 26 Islands Habitat Rehabilitation And Enhancement Project Pools 25 And 26, Mississippi River, Pike, Lincoln And St. Charles Counties, Missouri

Upper Mississippi River System Environmental Management Program

I. Purpose of this Evaluation

This document presents a Section 404(b)(1) Guideline evaluation for the Pools 25 & 26 Islands project. This evaluation is based on the regulations found at 40 CFR 230, Section 404(b)(1): Guidelines for Specification of Disposal Sites for Dredged or Fill Material.

The purpose of these Guidelines is to restore and maintain the chemical, physical, and biological integrity of waters of the United States through the control of discharges of dredged or fill material. Fundamental to these Guidelines is the precept that dredged or fill material should not be discharged into the aquatic ecosystem, unless it can be demonstrated that such a discharge will not have an unacceptable adverse impact either individually or in combination with known and/or probable impacts of other activities affecting the ecosystems of concern. From a national perspective, the degradation or destruction of special aquatic sites, such as filling operations in wetlands, is considered to be among the most severe environmental impacts covered by these Guidelines. The guiding principle should be that degradation or destruction of special sites may represent an irreversible loss of valuable aquatic resources.

These Guidelines have been developed by the Administrator of the Environmental Protection Agency in conjunction with the Secretary of the Army acting through the Chief of Engineers under section 404(b)(1) of the Clean Water Act (33 U.S.C. 1344). The Guidelines are applicable to the specification of disposal sites for discharges of dredged or fill material into waters of the United States.

II. Project Description

A. Location. The proposed project involves three islands. Westport Island, located in Pool 25 of the Mississippi River, lies in Lincoln County, Missouri, between river miles 257.5 and 254.0. This island is about five miles east of Elsberry. Dardenne and Bolters Islands are located about 20 miles to the south in Pool 26 of the Mississippi River in St. Charles County, Missouri, between river miles 228.0 and 224.5. These two islands are about five miles north of St. Peters.

B. General Description

1. Area Subject to Section 404 Jurisdiction. Essentially all of the project area is considered to be a water of the United States, and therefore subject to Section 404 review requirements. This is because these three islands are either below the plane of ordinary high water of the Mississippi River, or portions of these islands are considered to meet the definition of wetlands according to the Corps' wetlands delineation manual [U.S. Army Corps of Engineers-Environmental Laboratory (USACE-EL). (1987). "Corps of Engineers Wetlands Delineation Manual," Technical Report Y-87-1 (on-line manual), U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.]

At Westport Island, the plane of ordinary high water (OHW) at river mile 255.5 is 443.5 feet NGVD. At Dardenne Island, OHW at river mile 226.5 is at 428.5 feet NGVD. According to two-foot contour mapping obtained by the St. Louis District for these two islands, each of these islands is essentially below their respective OHW elevations.

According to USACE (1987), wetlands subject to Section 404 must exhibit positive indicators for hydric soils, wetland vegetation, and wetland hydrology. In summary, a small portion of Westport Island is considered wetlands, and nearly all of Dardenne and Bolters Islands are considered wetlands. Although wetland vegetation is present on all three islands, the soils of Dardenne and Bolters Islands are hydric because they exhibit a water table at a depth of one foot or less during the growing season, whereas the soils at Westport Island are not hydric because they are more permeable and consequently the water table is lower in the ground.

With regard to soils, Westport Island in Lincoln County is mapped as “Dockery silty clay loam, frequently flooded” (1,022 acres) and “water” (74 acres, <http://ims.missouri.edu/moims/step1.AOI/countylist.asp?STATUS=new>). The Dockery soil series is not classified by the Natural Resources Conservation Service as hydric, but inclusions of Carlow silty clay loam can occur within the Dockery series and they are classified as hydric or wetland soils (<http://efotg.nrcs.usda.gov/>). Carlow inclusions make up about 5 percent of the Dockery mapping unit, and they meet the hydric criterion because of the presence of a water table at a depth of one foot or less during the growing season (criterion 2B3). In St. Charles County, Dardenne Island is mapped as “Carlow silty clay loam, occasionally flooded” (762 acres) and “water” (9 acres). Bolters Island is also mapped as “Carlow silty clay loam, occasionally flooded” (527 acres) and “water” (14 acres). As mentioned above, the Carlow series is classified as hydric, and about 90 percent of the Carlow mapping unit is considered hydric.

Except for some abandoned cropland, the islands consist of predominantly forest. Bottomland forest is comprised of mostly facultative wetland plants (usually occur in wetlands, but also occur in nonwetlands), but also includes some obligate wetland species as well as facultative species (occur often in both wetlands and nonwetlands). Abandoned cropland consists of a variety of mainly herbaceous species but some small woody species.

Each of the islands is subject to flooding from the Mississippi River. The plane of ordinary high water is equivalent to a flood event having a return interval of about once in every two years.

2. Proposed Project Features for Recommended Plan. Proposed features at the three islands address the following objectives: expansion of floodplain forest, restoration of river-backwater connections, and creation and maintenance of deepwater habitat in backwater areas.

Westport Island (Pool 25)

a. Planting of native tree and shrub seedlings. Reforestation of 59 acres of abandoned cropland at sites with ground elevations exceeding 440 feet NGVD is proposed on this 625-acre island. Tree seedlings to be planted would consist of hard mast species such as pin oak (*Quercus palustris*), swamp white oak (*Quercus bicolor*), bur oak (*Quercus macrocarpa*), pecan (*Carya illinoensis*), and Schuette oak (*Quercus x schuettii*, a hybrid between swamp white and bur oak). Native shrub species such as deciduous holly (*Ilex decidua*) and green hawthorne (*Crataegus viridis*) would be planted also. Plant materials would consist of seedlings produced using a root-pruned method, placed on a 30 by 30 foot spacing (49 per acre).

b. Removal of sediment from island channel. Mechanical dredging of sediment is proposed in a portion of an existing 2,000-foot-long natural channel at the lower end of Westport Island. Sediments totaling 1,535 cubic yards would be removed from 1,000 feet of the channel to provide an additional three feet of channel depth across a channel bottom width of five feet. Dredge material would be side cast within a 0.7-acre disposal area (30 feet wide by 1,000 feet long) sited along the existing channel.

c. Placement of water control structure in island channel. A water control structure consisting of stop logs would be installed in the excavated channel. It is expected that this structure would be constructed off-site.

d. Permanent access road. A 1,265-foot long would be constructed to provide access to the water control structure from the island's edge. The road would be 20 feet wide, and consist of 12-inch thick crushed stone on geotextile fabric.

Dardenne Island (Pool 26)

a. Planting of native tree and shrub seedlings. Planting of tree and shrub seedlings at Dardenne Island would follow the same procedure to be used at Westport Island, except that planting sites in abandoned cropland would be in areas above 428 feet NGVD. Fifty-two acres of plantings are proposed on this 790-acre island.

Bolters Island (Pool 26)

a. Removal of sediment from island channel. Similar to Westport Island, mechanical dredging of sediment from an existing 1,250-foot-long natural channel at the lower end of Bolters Island (560 acres) is proposed. Sediments totaling 1,900 cubic yards would be removed from the channel to provide an additional three feet of channel depth across a channel bottom width of five feet. Dredge material would be side cast within a 0.85-acre disposal area (30 feet wide by 1,250 feet) sited along the existing channel.

b. Construction of rock dike structure and excavation of deep hole in island slough. A rock dike structure is proposed to be constructed in an interior slough at the lower end of the island, and a deep hole is proposed to be excavated immediately adjacent to the dike. The rock dike structure would be U-shaped and would consist of 165 tons of graded B stone. Sediments totaling 2,900 cubic yards would be mechanically excavated to a depth of eight feet in a 0.5 acre U-shaped area having a 13-foot wide bottom. Excavated sediments would be placed along either bank of the slough in two disposal areas measuring about 200 by 300 feet each.

c. Temporary access road. A 515-foot long road would be constructed to provide access to the natural channel and interior slough from the island's edge. The road would be 20 feet wide, and consist of 12-inch thick crushed stone on geotextile fabric.

C. Authority and Purpose. This project has been conducted under the authority of the Habitat Rehabilitation and Enhancement Project (HREP) component of the Upper Mississippi River System-Environmental Management Program. Initial authorization and appropriations for the Environmental Management Program were provided on August 15, 1985 by the Supplemental Appropriations Bill (PL 99-88). A more comprehensive authorization was provided by Section 1103 of the Water Resources Development Act (WRDA) of 1986 (PL 99-662). Subsequent WRDA language of 1992, 1996, and 1999 further modified the authorization.

D. General Description of Dredged or Fill Material

1. General Characteristics of Material (grain size, soil type)

a. Fill Material. Fill materials include rock (quarry run limestone consisting of graded B stone, 12" crushed stone) and earthen material (on-site sediments consisting of silts and clays).

b. Dredged Material. Dredged material, defined as material that is either dredged or excavated from waters of the United States, will consist of sediments (alluvial silts and clays) to be mechanically dredged or excavated from natural channels and sloughs.

2. Quantity of Material. The following quantities of materials will be handled:

Westport Island

sediments (mechanical dredging, natural channel)	1,535	cubic yard
backfill (earthen material, water control structure)	<1	cubic yard
12" crushed stone (permanent access road)	2,163	ton
earthen material (excavated to make planting holes)	105	cubic yard

Dardenne Island

earthen material (excavated to make planting holes)	95	cubic yard
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Bolters Island

sediments (mechanical dredging, natural channel)	1,900	cubic yard
graded B stone (rock dike structure in slough)	165	ton
sediments (mechanical dredging, slough)	2,900	cubic yard
12" crushed stone (temporary access road)	1,482	ton

3. Source of Material. Stone used for the project will be obtained from commercial stone quarries in the vicinity of the project area. Earthen material will be obtained from onsite.

E. Description of the Proposed Discharge Sites

1. Location. The location of the proposed features and work is displayed in the project's Environmental Assessment and associated drawings. These discharge sites are located on islands of the Mississippi River.

2. Size (acres) and Types of Habitat. The proposed discharge sites at all three islands total about 5.25 acres.

Westport Island

<0.1 acre	tree planting over 59 acres	abandoned cropland
0.7 acre	disposal area, sediment from natural channel	forested wetland
<0.1 acre	water control structure, backfill	natural channel
0.6 acre	permanent access road	forested wetland

Dardenne Island

<0.1 acre	tree planting over 52 acres	abandoned cropland
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Bolters Island

0.85 acre	disposal area, sediment from natural channel	forested wetland
2.75 acre	disposal area, sediment from slough	forested wetland
0.1 acre	disposal area, rock dike structure	slough
0.25 acre	temporary access road	herb. & forested wetland

Excavation to remove sediments will affect about 0.4 acres of natural channel habitat on Westport Island, and on Bolters Island about 0.5 acres of natural channel habitat and about 0.5 acres of slough habitat.

3. Type of Site (confined, unconfined, open water)

a. Permanent Deposits of Dredged and Fill Material. All disposal sites are for permanent deposits of dredged and fill materials, except for the temporary access road on Bolters Island. These disposal sites will be unconfined.

b. Temporary Deposits of Fill Materials. The access road on Bolters Island is the only temporary disposal site. It will be unconfined.

4. Timing and Duration of Discharge. Work to be performed will need to be accomplished during normal (nonflood) pool conditions. Depending on local weather and flooding conditions, the estimated duration of the construction period is about nine months. Actual duration of discharges will only be a fraction of that time.

F. Description of Disposal Method (hydraulic, drag line, etc.). Sediment removed from the natural channels on Westport and Bolters Islands will be dredged mechanically, as will the sediment from the slough on Bolters Island to create the deep hole. Heavy equipment such as a backhoe is expected to be used to excavate these sites. This piece of equipment is expected to be capable of placing excavated sediments into the proposed disposal sites. Trucks will haul graded B stone to the site of the rock dike structure on Bolters Island, and 12" crushed stone to the sites of the access roads on Westport and Bolters Islands.

III. Factual Determinations

A. Physical Substrate Determinations

1. Substrate Elevation and Slope. On Westport Island, ground elevations range from about 435 to 445 feet NGVD. On Dardenne and Bolters Islands, ground elevations range from about 420 to 430 feet NGVD. Most of the natural slopes within the project area are less than two percent.

2. Sediment Type (grain size). The digital soil survey for Lincoln and St. Charles Counties describes the soils within the project area as alluvial materials consisting of silty clay loams. Material on the bottom of the slough on Bolters Island and in the natural channels on Westport and Bolters Islands probably consists of finer grained materials.

3. Dredged/Fill Material Movement. Dredged and fill materials will be subject to the forces of flood flows. As none of the disposal sites will be confined, all materials will have the potential to migrate downhill.

4. Physical Effects on Benthos (burial, changes in sediment type, etc.). Benthos (organisms that live on the bottom of water bodies) are found in the aquatic portions of the project area, which include the natural channels on Westport and Bolters Islands, and the interior slough on Bolters Island. Benthos present in these areas, which total about 1.5 acres, will be destroyed by either excavation or burial.

5. Other Effects. No other effects are expected.

6. Actions Taken to Minimize Impacts. The primary actions taken to avoid adverse effects on the substrate are designing stable slopes on structures, use of stone large enough to resist erosive forces, placement of silt fences or hay bales to arrest the migration of material, and revegetation measures to minimize erosion (lateral movement) of fill or dredged materials.

B. Water Circulation, Fluctuation and Salinity Determinations

1. Water

a. Salinity. Not applicable.

b. Water Chemistry. No changes in water chemistry are anticipated.

c. Clarity. Water clarity within the interior slough on Bolters Island is expected to experience temporarily elevated turbidity levels during placement of the rock dike structure and excavation of the deep hole.

d. Color. No change is expected.

e. Odor. The recommended plan is not expected to have an impact on water odors.

f. Taste. The project is not expected to impact water taste; no surface waters within the project area serve as public water supplies.

g. Dissolved Gas Levels. Construction activities associated with the project will have no significant adverse impact on dissolved gas levels.

h. Nutrients. Nutrients are not expected to be released to wetland or aquatic areas during the construction process.

i. Eutrophication. The project is not expected to contribute toward eutrophication of the water column in aquatic areas.

j. Water Temperature. Temperatures are not expected to change, except for those in the deep hole to be excavated in the interior slough on Bolters Island, where greater water depth is expected to attenuate extremes in winter and summer to some degree.

2. Current Patterns and Circulation

a. Current Patterns and Flow. The hydraulic connection between the Mississippi River and interior sloughs on Westport and Bolters Islands is expected to become more frequent with the removal of accumulated sediments from these channels. The rock dike structure to be placed in the interior slough on Bolters Island is designed to concentrate erosive forces of overtopping river flows into the area of the deep hole. At low river levels, this structure is expected to act as a barrier within the slough, and may retard the circulation of the upper water column due to wind action. The water control structure to be placed in the natural channel at Westport Island is designed to stop or retard the exchange of water between the island's interior slough complex and the river. Other than these anticipated changes, no other changes to patterns or circulation are expected.

b. Velocity. Increases in velocity are expected in the interior slough on Bolters Island at the rock dike structure when the river is high and overtops the island, and in the natural channel on Westport Island at the location of the water control structure, when velocity will decrease when the structure is closed. Reductions in velocity are expected in the areas of tree planting when the river overtops the island, due to the roughness presented by the vegetation as it grows.

c. Stratification. Stratification is expected to occur only in the deep hole to be created in the interior slough on Bolters Island.

d. Hydrologic Regime. The project will not alter the seasonal or annual hydrologic regime of Pools 25 or 26. The hydrologic regime of the interior sloughs on Westport and Bolters Islands will become more dynamic due to the removal of sediments within the natural channels that connect these sloughs with the Mississippi River. The water control structure on Westport Island will be left open most of the time, but once every two to three years, it is expected to be closed temporarily by the Missouri Department of Conservation to hold water in the interior slough complex while the river is falling.

3. Normal Water Level Fluctuations (tides, river stage, etc.). The project will not affect normal fluctuations in the elevation of Pools 25 and 26.

4. Salinity Gradients . Not applicable.

5. Actions Taken to Minimize Impacts. The water control structure to be placed in the natural channel on Westport Island will be designed in such a manner that when in the open position, it will not impede movement of water to and from the river.

C. Suspended Particulate/Turbidity Determinations

1. Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Site. Increases in suspended particulates and turbidity due to construction activities are expected to be the greatest in the vicinity of the rock dike structure and adjacent deep hole in the interior slough on Bolters Island. These increases are expected to be of relatively short duration after construction is completed. Minor temporary increases in levels of particulates and turbidity levels may occur on

Bolters Island at the junction of the Mississippi River and the natural channel to be cleaned out of sediment. Elsewhere construction activities are to be conducted “in the dry” when river levels are low, and such changes are not expected.

2. Effects (degree and duration) on Chemical and Physical Properties of the Water Column.

The natural channels on Westport and Bolters Islands are shallow and at low river levels have little water in them. The interior sloughs on these islands are permanent and deeper (average depth 2 to 3 feet).

a. Light Penetration. Because of the shallow depth of Bolters Island’s slough, a decrease in light penetration is unlikely.

b. Dissolved Oxygen. The only expected change in dissolved oxygen levels is in the deep hole to be excavated in the slough on Bolters Island; levels in summer are expected to be somewhat higher after the project is completed than in the rest of the slough.

c. Toxic Metals and Organics. No toxic metals or organics are known to occur at any proposed disposal site of fill or dredged material.

d. Pathogens. There is no reason to believe any pathogens exist in any of the proposed areas of construction.

e. Aesthetics. Aesthetics of work sites are likely to be temporarily adversely affected during construction, but are expected to improve with the establishment of vegetation after construction.

f. Water Temperature. No changes in water temperatures are expected to occur, except at the deep hole, where temperature extremes during winter and summer occurring in the rest of the slough are expected to be attenuated by the greater water depth.

3. Effects on Biota

a. Primary Production, Photosynthesis. No impacts to primary production and photosynthetic processes are expected to occur.

b. Suspension/Filter Feeders. A temporary reduction in benthos production is expected only in the slough on Bolters Island in the vicinity of the rock dike structure and deep hole.

c. Sight Feeders. Temporary impacts to sight-feeders are expected in the Bolters Island slough in the vicinity of the rock dike structure and deep hole.

4. Actions taken to Minimize Impacts. Actions to minimize impacts associated with suspended particulates and turbidity include placement of silt curtains in the Bolters Island slough upstream and downstream of the work site, seeding of disposal sites to minimize erosion, and design of adequate sideslopes in channel cleanout areas to prevent erosion.

D. Contaminant Determinations. No toxic metals or organics are known to occur at any proposed disposal site of fill or dredged material.

E. Aquatic Ecosystem and Organism Determinations

1. Effects on Plankton. No impacts on phytoplankton production are expected.

2. Effects on Benthos. Benthic organisms in Bolters Island slough in the vicinity of the rock dike structure and deep hole are expected to be lost due to burial or excavation, as well as in the natural channels to be cleaned of sediments on Westport and Bolters Islands. These sites are expected to become recolonized after construction is completed.

3. Effects on Nekton. The term “nekton” refers basically to larger, free swimming aquatic organisms, such as fishes. Adverse impacts on sight-feeding fish are expected to be limited to Bolters Island slough.

4. Effects on Aquatic Food Web. Construction activities are not expected to disrupt the aquatic food chain.

5. Effects on Special Aquatic Sites

a. Sanctuaries and Refuges. Westport Island Natural Area envelops about 480 acres of the lower half of Westport Island, and was established in 1984 to protect a large undisturbed area of old-growth bottomland forest along with sloughs and shrub swamps. Only minimal man-made alterations are allowed in the natural area. The proposed mechanical excavation of sediments from the natural channel, placement of the water control structure, and construction of the permanent access road are located in this natural area.

b. Wetlands. Construction activities are expected to impact about 5.25 acres of wetlands. (In addition to these wetland impacts, about 0.9 acres of natural channels will be affected by mechanical dredging.) Of the wetland impacts, disposal sites for mechanically dredged sediments will affect about 4.3 acres, and access roads will affect about 0.85 acres. Sediments taken from the natural channels will be placed in 1.55 acres of forested wetland disposal sites at an average depth of about 1.5 feet. Tree clearing at these disposal sites will be minimal. Sediments obtained from the Bolters Island slough will be placed in 2.55 acres of forested wetland disposal sites at an average depth of 0.65 feet (about 8 inches). At these disposal sites, tree clearing is expected to be more extensive. Crushed rock for access roads will be placed in 0.85 acres of forested and herbaceous wetlands at an average depth of 12 inches. Tree clearing for access roads will also be minimal. Tree planting sites in abandoned cropland on Westport Island are not considered wetlands (because of the absence of hydric soils), whereas on Dardenne Island, tree planting sites in abandoned cropland are considered wetlands (because of the presence of wetland soils).

The planting of 52 acres of tree and shrub seedlings in wetlands (abandoned cropland) on Dardenne Island is expected to offset the temporary and permanent impacts associated with construction activities affecting about 5.25 of forested (and a little herbaceous) wetlands.

c. Mud Flats. No mud flat-like conditions exist within any proposed discharge site.

d. Vegetated Shallows. No vegetated shallows occur at any proposed disposal sites.

e. Coral Reefs. Not applicable.

f. Riffle and Pool Complexes. There are no riffle and pool complexes in the project area.

6. Threatened and Endangered Species. In compliance with Section 7(c) of the Endangered Species Act of 1973, as amended, the St. Louis District received from the U. S. Fish and Wildlife Service the following list of federally threatened or endangered species, currently classified or proposed for classification that may occur in the vicinity of the Pools 25 and 26 Islands project.

Lincoln County (pool 25, Westport Island):

Bald eagle (*Haliaeetus leucocephalus*) - threatened

Indiana bat (*Myotis sodalis*) - endangered

Spectaclecase mussel (*Cumberlandia monodonta*) - candidate

St. Charles (pool 26, Dardenne and Bolter Islands):

Bald eagle (*Haliaeetus leucocephalus*) - threatened

Indiana bat (*Myotis sodalis*) -endangered

Eastern massasaugua (*Sistrurus catenatus catenatus*) - candidate

Pallid sturgeon (*Scaphirhynchus albus*) - endangered

Decurrent false aster (*Boltonia decurrens*) - threatened

Running buffalo clover (*Trifolium stoloniferum*) – endangered

Based on our evaluation, it is the St. Louis District's opinion that the proposed project will not adversely impact any of the five threatened or endangered species or two candidate species, provided that tree felling is restricted to the time of the year (September 1 through March 31) when Indiana bat maternity colonies are not present. Likewise, the action will not affect any critical habitat of these species.

7. Other Fish and Wildlife. Sloughs on islands that are connected periodically to the Mississippi River through natural connections serve as spawning, rearing, and overwintering habitat for riverine fishes. Shallow water depths in these sloughs have limited the value of these areas as overwintering habitat. Creation of the deep hole in the interior slough on Bolters Island and construction of the rock structure to maintain its depth are expected to provide about 0.3 acres of overwintering habitat. Sedimentation in the natural channels that form temporary connections with the river reduces the amount of time these connections occur. Excavation of the channels on Bolters and Westport Islands will increase the amount of time they can perform this function. Since the combination of deep hole excavation with a scouring rock structure on Bolters Island is novel, this portion of the project is considered experimental.

Reforestation of abandoned cropland using various species of oak-hickory tree seedlings on Westport and Dardenne Islands is expected to benefit wildlife species that forage for mast. Such tree species are underrepresented on the Mississippi River floodplain following land clearing for agriculture and the flood of 1993. The Missouri Department of Conservation manages these islands for river-associated wildlife species including mammals, waterfowl and other birds, reptiles, and amphibians.

Waterfowl would benefit once the trees begin producing a mast food source and from the thermoregulatory benefits the trees would provide by acting as a windbreak. A mast crop can be expected from some species in three to five years. The planted area is expected to be used for food and shelter by such species as bobwhite quail, turkey, deer, squirrels, various species of waterfowl, and other migratory birds that feed on insects found in oaks. These benefits would increase progressively as the stand matures. The establishment of larger blocks of continuous forest by planting abandoned cropland would also benefit area sensitive species such as the pileated woodpecker. Without the tree planting proposed by this project, the forest habitat component on these islands would continue to degrade. The improvement in connections between the river and interior sloughs on Bolters and Westport Islands is also expected to benefit a variety of mammals, birds, amphibians, and reptiles that use these open-water wetlands as either feeding areas or for reproduction.

8. Actions to Minimize Impacts. More intrusive habitat improvements on Westport Island that would be located within the natural area have been eliminated from further consideration. Adverse impacts to 5.25 acres of wetlands on Westport and Bolters Islands are not expected to be significant, given the proposed tree planting in 52 acres of wetlands (abandoned cropland) on Dardenne Island.

F. Proposed Disposal Site Determinations

1. Mixing Zone Determination. The discharges of fill and dredged material will largely occur in areas without permanent water (such as forested and herbaceous wetland). Discharges in areas of permanent water are limited to less than one acre of the 13-acre slough on Bolters Island. The concentration of resuspended material in this slough is not expected to be high enough to require a mixing zone.

2. Determination of Compliance with Applicable Water Quality Standards. Section 401 water quality certification will be required from the Missouri Department of Natural Resources.

3. Potential Effects on Human Use Characteristics.

a. Municipal and Private Water Supply. No municipal water supply will be adversely impacted by project construction.

b. Recreational and Commercial Fisheries. Commercial fisheries are present in Pools 25 and 26. Recreational fishing is also present, and the recommended plan is expected to benefit fishing opportunities.

c. Water Related Recreation. Water-related recreation is an important activity in Pools 25 and 26 of the Mississippi River. The recommended plan is not expected to impact this kind of recreation.

d. Aesthetics. Construction activities will have minor impacts on the aesthetic quality of the project area during the duration of the work. Noise and exhaust will be generated by heavy equipment during the construction process.

e. Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves. The project will not impact any of these resources.

f. Determination of Cumulative Effects on the Aquatic Ecosystem. Past, present, and reasonably foreseeable future Corps activities in Pools 25 and 26 of the Mississippi River include 1) the navigation project, 2) channel maintenance work including maintenance dredging and dikes and revetments, 3) other existing EMP-HREP projects (Batchtown, Stag Island, Cuivre Island, Calhoun Point, Dresser Island), 4) existing bullnose dikes at Slim, Peruque, and Portage Islands (constructed under the Avoid and Minimize Program), 5) and activities under the Navigation and Environmental Sustainability Program, including a dam point control study for Pool 25, design of lock expansion at Lock and Dam 25, and a fish passage study at Lock and Dam 26. Between these projects, there are no significant cumulative impacts on the aquatic ecosystem.

g. Determination of Secondary Effects on the Aquatic Ecosystem. No significant secondary impacts to the aquatic ecosystem have been identified.

IV. Findings of Compliance or Non-Compliance with the Restrictions on Discharge

A. Adaptation of the Section 404(b)(1) Guidelines to this Evaluation.

In this evaluation of discharges proposed as part of the Pools 25 & 26 Islands EMP-HREP project, the Environmental Protection Agency's Section 404(b)(1) Guidelines of 24 December 1980 were applied without significant adaptation.

B. Evaluation of Availability of Practicable Alternatives to the Proposed Discharge Site Which Would Have Less Adverse Impact on the Aquatic Ecosystem.

No practicable alternatives exist which meet the study objectives and do not involve discharge of fill into waters of the United States. As ground elevations on all islands are below the plane of ordinary high, there are no sites considered to be upland and not subject to the Clean Water Act. Hauling mechanically dredged sediments to disposal sites off these islands was not considered.

C. Compliance with Applicable State Water Quality Standards.

Water quality certification under Section 401 of the Clean Water Act will be required from the Missouri Department of Natural Resources. The certification's conditions will be incorporated into the project's plans and specifications. Coordination of the proposed plan with this agency will be accomplished.

D. Compliance with Applicable Toxic Effluent Standard or Prohibition under Section 307 of the Clean Water Act.

The proposed activities are not expected to violate the toxic effluent standards of Section 307 of the Clean Water Act.

E. Compliance with Endangered Species Act of 1973.

The recommended plan is not expected to adversely affect any of the seven federally listed endangered, threatened, or candidate species or their critical habitat, provided that a restriction on tree felling is imposed during the warm months when Indiana bats are assumed to be present.

F. Compliance with Specified Protection Measures for Marine Sanctuaries Designated by the Marine Protection, Research, and Sanctuaries Act of 1972.

Not applicable.

G. Findings of Significant Degradation of the Waters of the United States.

The proposed project will not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreation and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. Life stages of aquatic organisms and other wildlife would not be adversely affected in a significant manner. Significant adverse effects on aquatic ecosystem diversity, productivity and stability, and recreational, aesthetic and economic values would not occur.

H. Appropriate and Practicable Steps Taken to Minimize Potential Adverse Impacts of the Discharge on the Aquatic Ecosystem.

All appropriate and practicable measures have been taken through application of procedures contained in Subpart H of the Guidelines to insure minimal adverse effects of the proposed discharges. Actions to minimize impacts associated with suspended particulates and turbidity include placement of silt curtains in the Bolters Island slough upstream and downstream of the work site, seeding of disposal sites to minimize erosion, and design of adequate side slopes in channel cleanout areas to prevent erosion.

I. On the Basis of the Guidelines the Proposed Disposal Sites for the Discharge of Dredged and Fill Material.

Based on this evaluation, the proposed Pools 25 & 26 Island EMP-HREP project is specified as complying with the requirements of these guidelines with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects to the aquatic ecosystem.

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Date

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To be signed following the review of comments received during the public comment period.

